THE PEOPLES GAS AND NORTH SHORE GAS ENERGY EFFICIENCY PROGRAMS

Research & Development Program

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PEOPLES GAS® ENERGY EFFICIENCY PROGRAM NORTH SHORE GAS® ENERGY EFFICIENCY PROGRAM

2018 Research & Development Program Objectives

- Identify, evaluate and execute R&D projects with savings potential
  - Provide recommendations to program teams
  - Submit breakthrough technologies as TRM measure
- Expand focus to include innovative programs and community engagement
  - Prioritize income eligible initiatives
- Use knowledge to enhance program delivery
  - Share project outcomes with stakeholders
  - Leverage trade ally relationships

2018 R&D Projects - Breaking New Ground

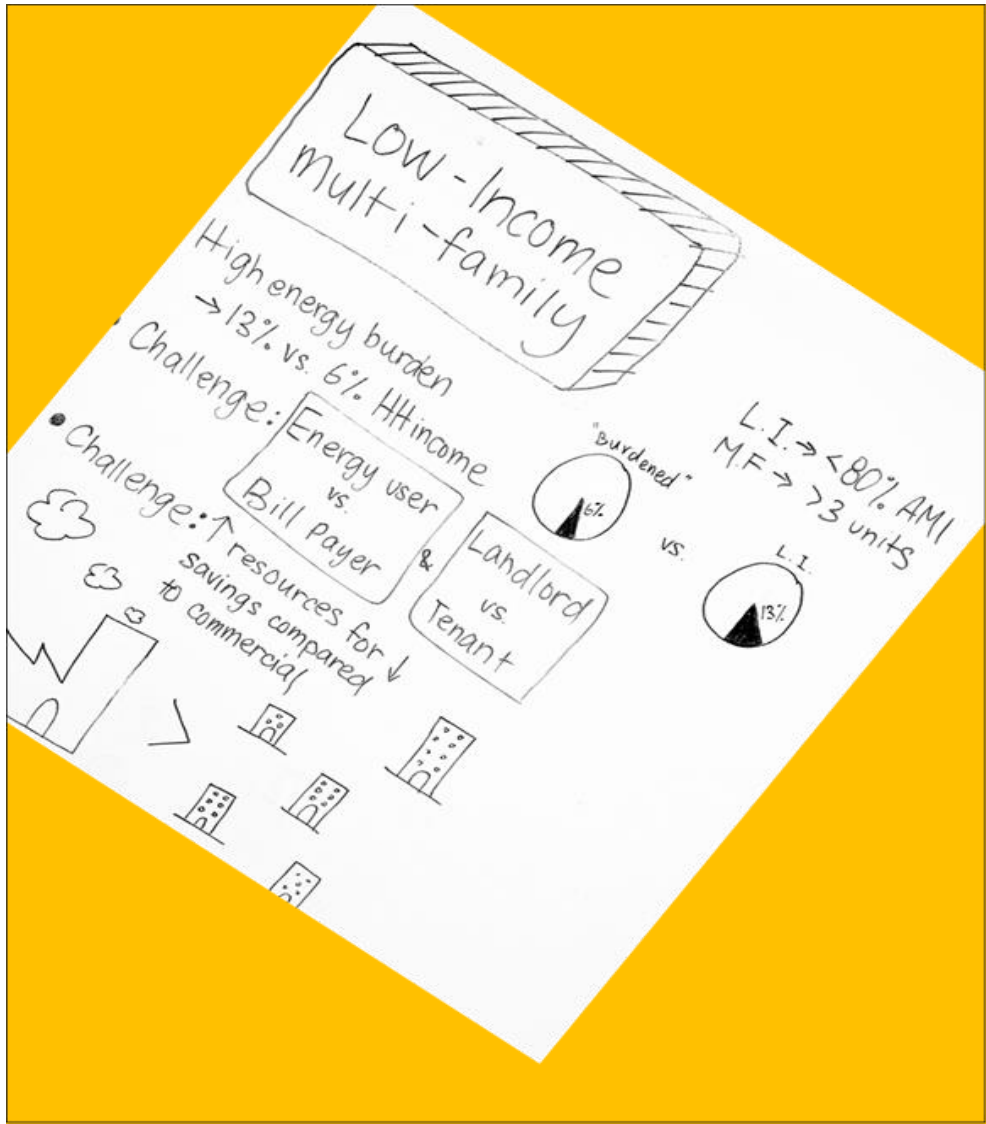
- Illinois Institute of Technology (IIT) class
- The Art Institute of Chicago
- Open Source Building Sensors (OSBS)
- Commercial Food Service Pilot
- Venturi Steam Traps

IIT– Entrepreneurship/Prototyping Class

- Interdisciplinary project with IIT graduate students
  - Goal was to research barriers and develop innovative approaches for implementing energy efficiency programs in income eligible neighborhoods
  - Targeted three sectors:
    - Small Business
    - Multi-family
    - Schools
  - Students interviewed residents and businesses in target areas
  - Class concluded with three project reports with prototype designs

IIT – Multi-family Project Example – Phase 1

- Primary research plan
  - Study behavior of renters shifted to property managers
- Secondary research plan
  - What studies have been done
- Findings
  - Program info source and trust
  - Energy = gas + electricity (same)
  - Customer experience (skeptical)
  - Need to reframe the problem



IIT– Prototyping Class – Program Design Principles

- Think long term:
  - Building trust in the community is a process and a commitment
  - An installation is just the beginning
- Build for the customer's lifestyle:
  - Fit into customer's life instead of customers fitting life to EE
  - Make it easy for customers to be energy efficient
- Make data your friend:
  - Energy usage data needs to be structured to show efficiency and progress
- Demonstrate accountability:
  - Assessment reports, and other claims of energy savings, must be validated and explained
  - Expectations should be made clear and supported with evidence

IIT – Multi-family Prototype Results

- Software solution called “Ally”
  - Provides building managers with capabilities including:
    - Benchmarking energy use
    - EE program tracking tied to energy bills
    - “Overspending” notice with visibility to participate in other EE programs
    - Feedback feature to implementation contractor
    - Communication with energy advisors and trade allies to allow for timely responsiveness
  - Allows building managers to integrate with business
- Moving to Phase II in Fall 2018

Art Institute of Chicago

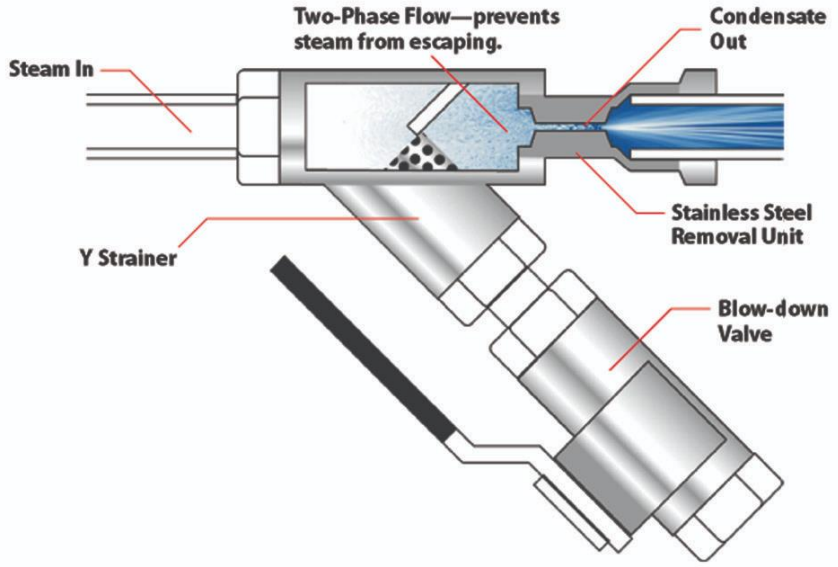
- Optimizing dehumidification using machine learning
  - Museum has unique space conditioning needs for preserving art work
  - Over cooling and reheating was wasting energy (gas & electric)
  - BAS predicted air discharge temperature versus actual temperature (opportunity for savings)
  - Leveraged Microsoft grant to develop machine learning system
  - Phase II expansion to other galleries planned for Fall 2018
  - Numerous applications beyond the Art Institute

Open Source Building Sensors (OSBS)

- Low cost sensor/control platform for buildings lacking automation systems
  - Wireless transceivers for measuring/transmitting operational data
  - Does not require internet access
  - Inexpensive sensor nodes are easy to deploy
  - Integrates with existing off-the-shelf thermostats and equipment
  - Projected 10-30% savings annually

Venturi Steam Trap

- Advance on orifice traps and alternative to mechanical trap
- Used extensively in Europe but not as much in the U.S.
- Operating life is at least 10 years compared to ~5 years for mechanical traps
- Testing at Gas Technology Institute (GTI) lab under different pressures (15-130 psi) and pipe diameter (1/2”-2”)
- Results indicate promise, even under range of pressure savings *if sized correctly*
- Phase II (2019) intended as a field study



Upstream Commercial Food Service (CFS)

- Nicor, ComEd, Peoples Gas and North Shore Gas funded study through the Gas Technology Institute (GTI)
- Average energy use in CFS is 350,000Btu/sf/year (3x office building use)
- Existing downstream CFS incentive programs have had low adoption
- Phase I: Characterize facilities, baseline, efficiency potential, downstream measures and structure of CFS market
- Phase II: Develop and implement CFS pilots

GTI – Utilization Technology Program (UTD)

- Gas utility funded research program with national/international participation
- Covers wide range of gas-focused efficiency research
- Semi-annual meetings to make funding commitments for projects
- PGL/NSG funded completed projects include:
  - BEI heat sponge economizers for boilers
  - Ozone laundry project
    - Approved for inclusion in 2019 TRM

UTD
Utilization Technology Development

Questions & Discussion

The Peoples Gas and North Shore Gas
Energy Efficiency Programs

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